

## Porcupine Ray, *Urogymnus asperrimus*

Report Card assessment	Sustainable		
IUCN Red List Australian Assessment	Least Concern	IUCN Red List Global Assessment	Vulnerable
Global Assessors	Chin, A. & Compagno, L.J.V.		
Australian Assessors	Kyne, P.M., Heupel, M.R., White, W.T., Simpfendorfer, C.A. (Shark Action Plan) & Rigby, C.L.		
Report Card Remarks	Australian fishing pressure low, BRDs significantly reducing catch, marine parks provide refuge.		

### Summary

The Porcupine Ray is a medium-sized continental shelf ray distributed across tropical and subtropical waters of northern Australia and across the Indo-Pacific. It is caught incidentally and retained for its meat in at least Southeast Asia where significant population declines have occurred due to mostly unregulated fishing pressure. In Australia, it is caught incidentally and rarely in mostly trawl fisheries and likely released as most of these prohibit elasmobranch retention, although post-release mortality is unknown. Additionally, many of the trawl fisheries mandate the use of bycatch Reduction Devices (BRDs) which have been shown to reduce the catch of large rays by 94%. The Porcupine Ray is considered highly vulnerable to climate change due to its rarity and high habitat specificity. Many parts of the species' range across northern Australia have low fishing effort that is managed and it receives significant refuge in the extensive network of marine parks. The Porcupine Ray is assessed as globally Vulnerable (IUCN) and in Australia, as Least Concern (IUCN) (Kyne et al. 2021) and Sustainable (SAFS).



### Distribution

The Porcupine Ray occurs in tropical and subtropical waters of northern Australia and across the Indo-Pacific and possibly Eastern Atlantic, from Fiji to South Africa and possibly to West Africa (Last et al. 2016). In Australia, it has a wide range from Heron Island (Queensland) to Ningaloo Reef (Western Australia) (Last and Stevens 2009, Last et al. 2016).

### Stock structure and status

There is currently little information on population size, structure, or trend for the species. The population is inferred to have declined significantly across Southeast Asia due to high levels of mostly

unregulated exploitation, whereas in Australia, fishing pressure is limited and managed, and the population is suspected to be stable (Chin and Compagno 2015, Kyne et al. 2021).

## Fisheries

The Porcupine Ray is taken incidentally across the Indo-Pacific in a variety of fishing gears and is retained for its meat and highly-valued skin (except in Australia) (White et al. 2006, Chin and Compagno 2015). In Australia, it is taken in the Commonwealth Northern Prawn Fishery (NPF) and possibly in the Queensland East Coast Trawl Fishery, the Gulf of Carpentaria (GoC) Developmental Fishery, and GoC Inshore Fishery. It is also possibly caught in the Northern Territory Demersal Fishery (DF) and Western Australian prawn fisheries and Pilbara Fish Trawl Fishery. Bycatch reduction devices (BRDs) have been mandated in most of these fisheries since the early-mid 2000s and reduce the catch of the large rays by >94%, though they may not be as effective at excluding juveniles; the rarity of Porcupine Ray captures in the NPF precluded determining the level of species-specific reduction due to BRDs (Brewer et al. 2004, Gaughan and Santoro 2021). If it is caught, it would be released as elasmobranch retention is now prohibited, except in the Queensland GoC Inshore Fishery, although post-release mortality is unknown. The Porcupine Ray was considered potentially at risk of overfishing in the NPF due to estimated fishing mortality being above levels leading to population reduction; however, there was a high level of uncertainty with the estimated fishing mortality rate (Zhou and Griffiths 2008). The species is considered highly vulnerable to climate change due to its rarity and high habitat specificity (Chin et al. 2010). Across northern Australia, many parts of the species' range have low fishing effort and the species would receive refuge in the extensive network of marine parks (Parks Australia 2023).

## Habitat and biology

The Porcupine Ray is demersal on the continental shelf at depths of 0–130 m but mostly inshore in coral reefs, sandy reef lagoons, and mangrove habitats with juveniles site-attached to small areas of shallow inshore mud and mangroves (Chin and Compagno 2015, Weigmann 2016). Maximum size is 147 cm disc width (DW) and males mature at approximately 90 cm DW and females at approximately 100 cm DW (Last et al. 2016, Weigmann 2016). Little else is known of its biology.

Longevity and maximum size	Longevity: unknown Max size: 147 cm DW
Age and/or size at maturity (50%)	Males: ~90 cm DW Females: ~100 cm DW

**CAAB Code:** 37 035027

**Link to IUCN Page:** <https://www.iucnredlist.org/species/39413/68648645>

**Link to page at Shark References:** <https://shark-references.com/species/view/Urogymnus-asperrimus>

## References

- Brewer, D.T., Heales, D.S., Eayrs, S.J., Taylor, B.R., Day, G., Sen, S., Wakeford, J., Milton, D.A., Stobutzki, I.C., Fry, G.C., van der Velde, T.D., Jones, P.N., Wang, Y-G., Dell, Q., Austin, M., Hegerl, E., Sant, G., Boot, I., Carter, D., Jackson, P., LaMacchia, T., Lombardo, P., Lowe, L., Nelson, C., Nichols, J., O'Brien, M. and Palmer, J. 2004. *Assessment and improvement of TEDs and BRDs in the NPF: a co-operative approach by fishers, scientists, fisheries technologists, economists and conservationists*. Final Report on FRDC Project 2000/173. CSIRO Cleveland.
- Chin, A., Kyne, P.M., Walker, T.I. and McAuley, R.B. 2010. An integrated risk assessment for climate change: analysing the vulnerability of sharks and rays on Australia's Great Barrier Reef. *Global Change Biology* 16: 1936–1953.
- Chin, A. and Compagno, L.J.V. 2016. *Urogymnus asperrimus*. *The IUCN Red List of Threatened Species* 2016: e.T39413A68648645

- Gaughan, D.J. and Santoro, K. (eds). 2021. *Status Reports of the Fisheries and Aquatic Resources of Western Australia 2019/20: The State of the Fisheries*. Department of Primary Industries and Regional Development, Western Australia.
- Kyne, P.M., Heupel, M.R., White, W.T. and Simpfendorfer, C.A. 2021. *The Action Plan for Australian Sharks and Rays 2021*. National Environmental Science Program, Marine Biodiversity Hub, Hobart.
- Last, P.R. and Stevens, J.D. 2009. *Sharks and Rays of Australia*. Second Edition. CSIRO Publishing, Collingwood, Australia.
- Last, P., White, W., Carvalho, M.R. de, Séret, B., Stehmann, M. and Naylor, G.J.P. 2016. *Rays of the World*. CSIRO Publishing, Clayton, Victoria, Australia.
- Parks Australia 2023. Australian Marine Parks. <https://parksaustralia.gov.au/marine/parks/>
- Weigmann, S. 2016. Annotated checklist of the living sharks, batoids and chimaeras (Chondrichthyes) of the world, with a focus on biogeographical diversity. *Journal of Fish Biology* 88(3): 837–1037.
- White, W.T., Last, P.R., Stevens, J.D., Yearsley, G.K., Fahmi and Dharmadi. 2006. *Economically Important Sharks and Rays of Indonesia*. Australian Centre for International Agricultural Research, Canberra, Australia.
- Zhou, S.J. and Griffiths, S.P. 2008. Sustainability Assessment for Fishing Effects (SAFE): A new quantitative ecological risk assessment method and its application to elasmobranch bycatch in an Australian trawl fishery. *Fisheries Research* 91: 56–68.